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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/772,225

02/04/2004

Shilin Chen

SC-03-02

2188

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EXAMINER

JONES, HUGH M

ART UNIT

PAPER NUMBER

2128

MAIL DATE

DELIVERY MODE

07/08/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/772,225	Applicant(s) CHEN ET AL.	
	Examiner Hugh Jones	Art Unit 2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-104 is/are pending in the application.
- 4a) Of the above claim(s) 29-40 and 53-104 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28, 41-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/21/2008, 11/26/04, 4/9/04, 4/7/04, 4/5/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-104 of U. S. Application 10/772,225, filed on 2/4/2004 are pending.
Claims 1-28, 41-52 are elected; claims 29-40, 53-104 are withdrawn from consideration.

Drawings

2. Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. These are well known teachings in the art. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. **Claims 1-28, 41-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over [Ma et al. (“The computer simulation of the interaction between roller bit and rock” – 1995 – *of record*) or Ma (“The operational mechanics of the rock bit” – 1996 - *of record*)] in view of [Applicant’s admitted prior art].**

6. Ma et al. (“The computer simulation of the interaction between roller bit and rock” – 1995 – *of record*) discloses:

optimal roller bit design using computer simulation (entire paper);

operational mechanics of the roller bit geometry (“The model of bit and bottom”; “roller bit”; “bottom hole”);

kinematics of the bit (“The model of bit and bottom”; rotation angle of cone”; “The simulation of interaction”);

rock-bit interaction and crater analysis (“crater model”; “Interaction between bit and rock”);

bit design including force analysis (“The simulation of Interaction”).

7. Ma (“The operational mechanics of the rock bit” – 1996 - *of record*) discloses:

optimal roller bit design using computer simulation (chapter 6) based on the entire teachings in the book, including

operational mechanics of the roller bit geometry (details in chapter 2);

kinematics of the bit (details in chapter 3);
rock-bit interaction (details in chapter 5); and
bit design including force analysis (see page 232: “evaluate the size, load, motion, stress, and strain of each part...”).

8. Ma et al. (1995) or Ma et al. (1996) do teach optimal design but do not expressly teach that the optimal design consists of varying the specific types of teeth and their specific various locations and orientations as recited in the claims.

9. The specification teaches that the types of teeth and the variations of their possible locations and orientations were known (pp. 4-5: Background: roller cone bit design; pp. 5-6: Background: tooth design; pp. 6-7: types of bits corresponding to types of formations; pp. 7-8: interaction of bit and formation; pp. 8-9: bit design background; pg. 9: known needs for improvement).

10. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the teachings of Ma et al. to consider as optimal design such a design wherein the production is maximized. It was well known in the art at the time of the invention to those of ordinary skill in the art that a pervasive problem in the industry was that of finding optimal bit design. Thus, It would have been obvious to one of ordinary skill in the art at the time of the invention was to modify the teachings of Ma et al. to consider variations of known parameters in order to optimize drilling production.

11. Nothing inventive has been produced by varying the types of teeth and their various locations and orientations via *routine testing* (optimization) of a design.

12. The court (*Pfizer v. Apotex F.3d (Fed. Cir. 2007)*), referring to *Dystar*, distinguished 'routine testing' from *the work of an inventor*:

"The experimentation needed, then, to arrive at the subject matter claimed in the...patent was nothing more than routine application of a well-known problem solving strategy and, we conclude, the work of a skilled artisan, not of an inventor." (internal citation and quotations omitted) (citing *Dystar*).

13. The court characterized *the phamacopoeia- and compendium- guided work of the Plaintiff-Appellee as 'routine testing' conducted to merely verify an expectation of success in contrast to 'trial and error procedures' that support true discovery.*

14. The *act of designing* a bit indicates an *expectation of a successful design*.

15. The court further characterized Pfizer's 'routine testing' efforts as merely "verification testing...to ease its commercial manufacturing and marketing of the tablet form of the therapeutic [composition]," the Court quoted the language from *Dystar* that refers to the existence of an implicit motivation to combine when the efforts are aimed at creating a product that is more desirable because it is "stronger, cheaper, cleaner, etc." (emphasis added):

"At most, then, Pfizer engaged in routine, verification testing to optimize selection of one of several known and clearly suggested pharmaceutically-acceptable salts to ease its commercial manufacturing and marketing of the tablet form of the therapeutic amlodipine. Creating a "product or process that is more desirable, for example because it is stronger, cheaper, cleaner, faster, lighter, smaller, more durable, or more efficient . . . to enhance commercial opportunities . . . is universal—and even common-sensical." (emphasis added) (citing *Dystar*).

16. It would have also been obvious to a person of ordinary skill in the art at the time of the invention to simulate the interaction of a bit with the earth because it is recognized that use of a known technique (namely simulating the interaction of a bit with

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earth) to improve a similar apparatus (*drill bit*) in the same way is not sufficient to distinguish over the prior art.

17. One of ordinary skill in the art could have applied the known "improvement" technique in the same way to the "base" device and the results would have been predictable to one of ordinary skill in the art.

18. Applicants have not invented the simulation of bits, and have merely applied a known technique to improve a bit in the same way. The improvement is nothing more than the predictable use of known techniques to the prior art elements.

19. It would have been obvious to one of ordinary skill in the art at the time of the invention that a method of enhancing a particular class of apparatus was made part of the ordinary capabilities of one skilled in the art based upon the teaching of such improvement in other situations. One attempting to design an optimal bit would naturally simulate the interaction between the bit and earth to see which parameters lead to the optimal solution.

20. One of ordinary skill in the art would have been capable of applying known methods of simulating the interaction of roller cone bits with earth (Ma et al., for example) to the design of the bits and the results would have been predictable to one of ordinary skill in the art. The Supreme Court in KSR noted that "if the actual application of the technique would have been beyond the skill of one of ordinary skill in the art, then using the technique would not have been obvious."

21. KSR said that "[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of

ordinary skill has good reason to pursue the known options within his or her technical grasp. ... In that instance the fact that a combination was obvious to try might show that it was obvious...." The fact that applicants as well as others including Ma et al. are using the same techniques (designing bits using simulations of the bits with earth) to solve the same problem (maximizing drilling production), demonstrates that there are a finite number of predictable solutions (bit designs). Furthermore, there are only a finite number of drill bit parameters – thus there are a finite number of predictable solutions.

Response to Arguments (10/9/07, 4/21/08)

22. The Information Disclosure Statements have been considered in view of Applicant's remarks of 10/9/2007. Note that a few references do not appear to have been cited in an IDS and so are not considered. These include the following (which have not been lined through):

~~UNITED STATES PATENT NO. 5,712,210¹~~
~~UNITED STATES PATENT NO. 5,730,234¹~~
~~UNITED STATES PATENT NO. 5,814,143¹~~
UNITED STATES PATENT NO. 5,415,036¹
~~UNITED STATES PATENT NO. 5,791,220¹~~
~~UNITED STATES PATENT NO. 4,395,948¹~~
~~UNITED STATES PATENT NO. 5,326,100²~~
UNITED STATES PATENT NO. 5,605,198²
UNITED STATES PATENT NO. 5,010,789²
UNITED STATES PATENT NO. 6,142,247²
~~US 5,780,743²~~
~~US 5,448,053²~~
~~UNITED STATES PATENT NO. 6,010,500²~~
~~UNITED STATES PATENT NO. 6,088,280²~~

~~EP PATENT NO. EP-B-1117804 -- Communication mailed May 15, 2006⁵~~

~~US PATENT NO. 6,995,556~~

~~CN 2082755U⁶~~

~~M.A. Dekon, "The Operational Mechanics of the Rock Bit," Petroleum Industry Press, Beijing, China, 244 pages (1996)~~

~~D. Ma, & J.L. Azar, "Dynamics of Roller Cone Bits," Journal of Energy Resources Technology, Vol. 107 pp. 543-548 (Dec. 1985)~~

They will be considered once they are submitted/listed in an IDS.

Conclusion

23. Any inquiry concerning this communication or earlier communications from the examiner should be:

directed to: Hugh Jones telephone number (571) 272-3781,

Monday-Thursday 0830 to 0700 ET,

or

the examiner's supervisor, Kamini Shah, telephone number (571) 272-2279.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, telephone number (703) 305-3900.

mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 308-9051 (for formal communications intended for entry)

or (703) 308-1396 (for informal or draft communications, please label *PROPOSED* or *DRAFT*).

/Hugh Jones/

Primary Examiner, Art Unit 2128

June 24, 2009